THE HOST SPECIFICITY OF *UROPHLYCTIS LEPROIDES* (TRAB.) MAGN.

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SUMMARY. — Marbled tumor formation is induced on sugar beet (*Beta vulgaris* L.) by the fungus *Urophlyctis leproides*. Using the beet parasite prosporangia as inoculum one trial involving 70 herbaceous plant species was carried out. Only sugar beet was susceptible to this disease.

RÉSUMÉ. — *Urophlyctis leproides* est le champignon responsable de la formation des tumeurs marbrées de la Betterave à sucre (*Beta vulgaris* L.). Utilisant les prosporanges du parasite de la Betterave comme inoculum, un essai d'infection sur 70 espèces de plantes herbacées a été entrepris. Seule la Betterave est sensible à cette maladie.

KEY WORDS : sugar beet, tumors, host range, host specificity.

INTRODUCTION

Urophlyctis leproides (Trab.) Magn., the beet tumors fungus normally attacking the crown and leaves of sugar beet in North Tunisia (Fig. 1) was reclassified into the Urophlyctaceae (HADAR, 1982) a new family of the Spizellomycetales. Thus far little is known about the host range of *U. leproides* (HADAR, 1986). The purpose of this investigation was to be determined whether *U. leproides* produces tumors on plants other than *Beta vulgaris*.

MATERIALS AND METHODS

Inoculation with non-dormant prosporangia of *U. leproides* from sugar beet tumors was carried out in a growth chamber under favorable conditions for pathogenesis (25-30°C, 650 lux from continuous fluorescent light, 1 kg of soil infested with 18 g of dried tumors, heavy watering). Seventy species (10 individual plants) of plant were transplanted into infested soil in two series and incubated for 3 months. These species (Table 1) were chosen because they are common weeds and economically important plants in Tunisia. Plant names were taken from «Flore de la Tunisie» (POTTIER - ALAPETITE, 1979).

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TABLE 1

Amaranthaceae
Amaranthus retroflexus L.
Amaranthus gracilis Desf.
Amaranthus blitoides S. Wats.
Amaranthus graecizans L.
Amaranthus cruentus L.
Apiaceae
Ammi majus L.
Coriandrum sativum L.
Daucus carota L.
Kundmania sicula DC.
Petroselinum sativum Hoffm.
Torilis nodosa Gaert.
Asteraceae
Anacyclus clavatus Desf.
Aster squamatus Hiert.
Calendula arvensis L.
Chrysanthemum coronarium L.
Cichorium intybus L.
Erigeron bonariensis L.
Lactuca sativa L.
Picris echioides L.
Sonchus oleraceus L.
Boraginaceae
Borago officinalis L.
Heliotropium europeum L.
Brassiceae
Brassica napus L.
Capsella bursa-pastoris L.
Diplotaxis erucoides (L.) DC.
Raphanus raphanistrum L.
Raphanus sativus L.
Sinapis arvensis L.
Chenopodiaceae
Beta macrocarpa Guss.
Beta vulgaris L.
Chenopodium album L.
Chenopodium murale L.
Chenopodium opulifolium Schrad.
Chenopodium vulvaria L.
Spinacia oleracea L.
Convolvulaceae
Convolvulus arvensis L.
Convolvulus lineatus L.
Euphorbiaceae
Chrozophora tinctoria Juss.
Euphorbia helioscopia L.
Euphorbia peplus L.
Mercurialis annua L.
Fabaceae
Coronilla scorpioides (L.) Koch.
Medicago ciliaris Krack.
Medicago hispida Gaertn.
Medicago sativa L.
Melilotus sulcata Desf.
Trifolium jaminianum Boiss.
Vicia faba L.
Vicia sativa L.
Lamiaceae
Lamium amplexicaule L.
Mentha pulgegium L.
Salvia verbenaca L.
Liliaceae
Urginea maritima (L.) Bah.
Papaveraceae
Papaver rhaeas L.
Poaceae
Hordeum murinum L.
Lolium rigidum Gaud.
Phalaris paradoxa L.
Poa annua L.
Zea mays L.
Polygonaceae
Emex spinosus (L.) Campd.
Polygonum aviculare L.
Rumex bucephalophorus L.
Portulacaceae
Portulaca oleracea L.
Ranunculaceae
Ranunculus muricatus L.
Ranunculus sardous Crantz
Solanaceae
Capsicum annuum L.
Solanum lycopersicum L.
Solanum nigrum L.
Solanum tuberosum L.
Urticaceae
Urtica urens L.

OBSERVATIONS AND DISCUSSION

In this experiment *U. leproides* tumors were often observed on cultivated sugar beets rarely on wild beets. Tumors were artificially produced on eight commercially available cultivars of *B. vulgaris* (HADAR, 1986).

Figures 1-2 : symptoms of *Urophlyctis leproides* on sugar beet. — 1 : crown tumor of a plant naturally infected. 2 : various tumors on leaves artificially inoculated.

Figures 1-2 : symptômes d'*Urophlyctis leproides* sur la Betterave à sucre. — 1 : tumeur envahissant naturellement le collet. 2 : diverses tumeurs obtenues expérimentalement sur les feuilles.

As earlier indicated, the life cycle of this fungus consists of an endobiotic stage in living tissue of *B. vulgaris* and a saprophyte stage (HADAR, 1985). Among 70 species of plants belonging to different families, and including some chenopodiaceous species (*Beta vulgaris, Beta macrocarpa, Chenopodium album, Chenopodium murale, Chenopodium opulifolium, Chenopodium vulvaria* and

Spinacia oleracea) only sugar beet (*Beta vulgaris* L.) shows successful infection judged leaf tumor formation visible at 5 weeks after incubation (Fig. 2). Since the work thus far indicates that the host range of this fungus may be narrow, there is ■ possibility that *U. leproides* is endemic to sugar beet crop areas and has become adapted to this species at its specific chenopodiaceous host. Similar coevolution between related monophagous species of *Urophlyctis* and their specific hosts was mentioned in the literature such *U. pulposa* (Wall.) Schro. on *Atriplex patula* L., *U. pottero* Bartl. on *Lotus corniculatus* L., *U. alfalfae* (Lagh.) Magn. on *Medicago sativa* L. and *U. hemisphaerica* (Speg.) Syd. on *Kundmania sicula* DC. The causal fungus of *Beta vulgaris* tumors was non pathogenic on *M. sativa* and *K. sicula*. The finding that *U. leproides* affects only *B. vulgaris* is further evidence of its narrow host range specificity, and may be used as a taxonomic criterion in the identification of the pathogen responsible for this specific beet disease.

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